National Institute of Environmental Health Sciences

Weather and the transmission of bacillary dysentery in Jinan, northern China: A time-series analysis

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Abstract:

OBJECTIVES: This article aims to quantify the relationship between weather variations and bacillary dysentery in Jinan, a city in northern China with a temperate climate, to reach a better understanding of the effect of weather variations on enteric infections. METHODS: The weather variables and number of cases of bacillary dysentery during the period 1987-2000 has been studied on a monthly basis. The Spearman correlation between each weather variable and dysentery cases was conducted. Seasonal autoregressive integrated moving average (SARIMA) models were used to perform the regression analyses. RESULTS: Maximum temperature (one-month lag), minimum temperature (one-month lag), rainfall (one-month lag), relative humidity (without lag), and air pressure (one-month lag) were all significantly correlated with the number of dysentery cases in Jinan. After controlling for the seasonality, lag time, and long-term trend, the SARIMA model suggested that a 1 degree C rise in maximum temperature might relate to more than 10% (95% confidence interval 10.19, 12.69) increase in the cases of bacillary dysentery in this city. CONCLUSIONS: Weather variations have already affected the transmission of bacillary dysentery in China. Temperatures could be used as a predictor of the number of dysentery cases in a temperate city in northern China. Public health interventions should be undertaken at this stage to adapt and mitigate the possible consequences of climate change in the future.

Source: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2099327

Resource Description

Exposure :

weather or climate related pathway by which climate change affects health

Meteorological Factors, Meteorological Factors, Precipitation, Temperature

Geographic Feature:

resource focuses on specific type of geography

None or Unspecified

Geographic Location:

resource focuses on specific location

Non-United States

Non-United States: Asia

Asian Region/Country: China

Health Impact: ☑

specification of health effect or disease related to climate change exposure

Infectious Disease

Infectious Disease: Foodborne/Waterborne Disease

Foodborne/Waterborne Disease (other): Bacillary Dysentery

Mitigation/Adaptation: ☑

mitigation or adaptation strategy is a focus of resource

Adaptation

Model/Methodology: ☑

type of model used or methodology development is a focus of resource

Outcome Change Prediction

Population of Concern: A focus of content

Population of Concern: ☑

populations at particular risk or vulnerability to climate change impacts

Children, Low Socioeconomic Status

Resource Type: ☑

format or standard characteristic of resource

Research Article

Timescale: ☑

time period studied

Time Scale Unspecified

Vulnerability/Impact Assessment: ☑

resource focus on process of identifying, quantifying, and prioritizing vulnerabilities in a system

A focus of content